

WHAT IS CLAIMED IS:

1. An antibody comprising amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51 SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, wherein the antibody binds to human DC-SIGN.
2. The antibody of claim 1 further comprising a peptide attached to the antibody.
3. The antibody of claim 2 wherein the peptide comprises an antigen.
- 10 4. The antibody of claim 3 wherein the antigen comprises a cancer antigen.
5. A vaccine comprising the antibody of claim 3.
6. A vaccine comprising the antibody of claim 4.
7. A composition comprising an antibody as in claim 1 and a pharmaceutically acceptable carrier.
- 15 8. An antibody as in claim 1 wherein the antibody is a humanized antibody.
9. An antibody as in claim 1 wherein the antibody is an scFv.
10. An antibody that binds to human DC-SIGN comprising an amino acid sequence selected from the group consisting of SNDGYYS (SEQ ID NO: 47); RYYLGVD (SEQ ID NO: 48); DDSGRFP (SEQ ID NO: 49); YGYAVDY (SEQ ID NO: 50),
20 YYGIYVDY (SEQ ID NO: 51), FLVY (SEQ ID NO: 52), NFGILGY (SEQ ID NO: 53), YPNALDY (SEQ ID NO: 54) and GLKSIFYAMDH (SEQ ID NO: 55).
11. An antibody as in claim 10 wherein said amino acid sequence appears in the heavy chain CDR3 of the antibody.
12. An antibody that binds to human DC-SIGN comprising an amino acid
25 sequence selected from the group consisting of QHFWNTPWT (SEQ ID NO: 45); QQGHTLPYT (SEQ ID NO: 46); QQGKTLPT (SEQ ID NO: 56), QQGNTLPPT (SEQ ID NO: 57), QQHYITPLT (SEQ ID NO: 58), QQYGNLPYT (SEQ ID NO: 59),

QQYYSTPRT (SEQ ID NO: 60), GQSYNYPPT (SEQ ID NO: 61) and WQDTHFPHV (SEQ ID NO: 62).

13. An antibody as in claim 12 wherein said amino acid sequence appears in the light chain CDR3 of the antibody.

5 14. A method for interfering with the interaction of DC-SIGN expressing cells and ICAM-expressing cells comprising administering to a subject an effective immune-modulating amount of an antibody in accordance with claim 1.

15. A method for generating an immune response comprising administering to a subject an effective immune-modulating amount of an antibody in accordance with claim 2.

10 16. A method for interfering with the interaction of DC-SIGN expressing cells and ICAM-expressing cells comprising administering to a subject an effective immune-modulating amount of an antibody in accordance with claim 10.

15 17. A method for interfering with the interaction of DC-SIGN expressing cells and ICAM-expressing cells comprising administering to a subject an effective immune-modulating amount of an antibody in accordance with claim 12.

18. A method for delivering an antigen to DC-SIGN expressing cells comprising attaching said antigen to an antibody comprising an amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, wherein the antibody binds to human DC-SIGN.

19. An antibody that recognizes a DC-SIGN receptor on a cell comprising an amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, the antibody being capable

of effectively blocking binding of a virus selected from the group consisting of HIV, HCV, Ebola, SARS, CMV, Sindbis and Dengue to the cell.

20. An antibody in accordance with claim 19, wherein the antibody also binds to L-SIGN.

5 21. An antibody that recognizes a DC-SIGN receptor on a cell comprising an amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, the antibody being capable
10 of effectively blocking infection of the cell by a virus selected from the group consisting of HIV, HCV, Ebola, SARS, CMV, Sindbis and Dengue.

22. An antibody in accordance with claim 21, wherein the antibody also binds to L-SIGN.

15 23. An antibody that recognizes a DC-SIGN receptor on a cell comprising an amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, the antibody being capable
20 of effectively blocking transmission of a virus selected from the group consisting of HIV, HCV, Ebola, SARS, CMV, Sindbis and Dengue from the cell to another cell.

24. An antibody in accordance with claim 23, wherein the antibody also binds to L-SIGN.

25 25. An antibody that recognizes a DC-SIGN receptor on a cell comprising an amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID

NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, the antibody being capable of effectively blocking binding of a bacteria selected from the group consisting *Helicobacter pylori*, *Klebsiella pneumoniae*, *Mycobacteria tuberculosis* and *Mycobacteria Bovis* to the cell.

26. An antibody that recognizes a DC-SIGN receptor on a cell comprising an amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, the antibody being capable of effectively blocking infection of the cell by a bacteria selected from the group consisting *Helicobacter pylori*, *Klebsiella pneumoniae*, *Mycobacteria tuberculosis* and *Mycobacteria Bovis*.

27. An antibody that recognizes a DC-SIGN receptor on a cell comprising an amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, the antibody being capable of effectively blocking transmission of a bacteria selected from the group consisting *Helicobacter pylori*, *Klebsiella pneumoniae*, *Mycobacteria tuberculosis* and *Mycobacteria Bovis* from the cell to another cell.

28. An antibody that recognizes a DC-SIGN receptor on a cell comprising an amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, the antibody being capable of effectively blocking binding of a parasite selected from the group consisting of *Leishmania pifanoi* and *Schistosoma mansoni* to the cell.

29. An antibody that recognizes a DC-SIGN receptor on a cell comprising an amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, the antibody being capable of effectively blocking infection of the cell by a parasite selected from the group consisting of *Leishmania pifanoi* and *Schistosoma mansoni*.

30. An antibody that recognizes a DC-SIGN receptor on a cell comprising an amino acid sequence having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62, the antibody being capable of effectively blocking transmission of a parasite selected from the group consisting of *Leishmania pifanoi* and *Schistosoma mansoni* from the cell to another cell.

31. A diagnostic agent for a tumor characterized by increased DC-SIGN expression comprising an antibody that recognizes a DC-SIGN receptor.

32. A diagnostic kit comprising the diagnostic agent of claim 31.

33. A method for diagnosing cancer comprising:

obtaining a tissue sample from a subject suspected of having cancer; and
determining the degree to which the tissue sample binds with an antibody that recognizes a DC-SIGN receptor having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62,
wherein an increase in the degree of binding compared to corresponding normal tissue indicates the presence of cancer.

34. A method as in claim 33 wherein the determining step comprises staining for the presence of DC-SIGN.

35. A therapeutic agent for treating a cancer characterized by increased DC-SIGN expression comprising an antibody that recognizes a DC-SIGN receptor having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62.

36. A method for treating a cancer comprising administering to a subject a cancer cell killing amount of a composition comprising an antibody that recognizes a DC-SIGN receptor having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62.

37. The method of claim 36 wherein the antibody that recognizes the DC-SIGN receptor induces antibody-dependent cellular cytotoxicity of cancer cells.

38. The method of claim 36 wherein the antibody that recognizes the DC-SIGN receptor induces complement-dependent cytotoxicity of cancer cells.

39. The method of claim 36 wherein the antibody that recognizes the DC-SIGN receptor prevents negative regulation of the immune system through DC-SIGN expressing cancer cells.

40. A method as in claim 36 wherein the antibody is fused to a toxin.

41. A method as in claim 36 wherein the antibody is fused to a high energy radiation emitter.

42. A method for treating an inflammatory disease comprising administering to a subject a dendritic cell killing amount of a composition comprising an antibody that recognizes a DC-SIGN receptor having at least 80% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52, SEQ

ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 57, SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 61, and SEQ ID NO: 62.

43. The method of claim 42 wherein the antibody that recognizes the DC-SIGN receptor induces antibody-dependent cellular cytotoxicity of dendritic cells.

5 44. The method of claim 42 wherein the antibody that recognizes the DC-SIGN receptor induces complement-dependent cytotoxicity of dendritic cells.

45. The method of claim 42 wherein the antibody that recognizes the DC-SIGN receptor prevents negative regulation of the immune system through DC-SIGN expressing dendritic cells.

10 46. A method as in claim 42 wherein the antibody is fused to a toxin.

47. A method as in claim 42 wherein the antibody is fused to a high energy radiation emitter.